

09a Total greenhouse gas emissions from the national economy

Indicator type **Core indicator**

Published

Versioning

First publication Latest update

Area and sub-area

Area and sub-area

Presentation

Tier	<input type="text" value="1"/>
Indicator definition and description	The indicator measures total greenhouse gas (GHG) emissions from all residents of a national economy. Residents can be persons, groups of persons in the form of households, and legal or social entities, such as corporations, non-profit institutions, or government units. Residents belong to the national economy where they have their centre of predominant economic interest.
Unit of measure	<input type="text" value="Kilotonnes (kt) of CO2 equivalent"/>
Coverage	<input type="text" value="Total economy; production and consumption activities"/>
Spatial aggregation	<input type="text" value="National economy"/>
Reference period	<input type="text" value="Calendar year"/>
Update frequency	<input type="text" value="Annual"/>
Base period	<input type="text" value="Not applicable"/>

Disaggregation (operational indicators)

Disaggregation (operational indicators)	Comments
<input type="text" value="Economic sector (ISIC) and households"/>	<input type="text"/>
<input type="text" value="Spatial"/>	<input type="text"/>
<input type="text" value="Temporal (by month, by season)"/>	<input type="text"/>

Other related -indicators (e.g.contextual, proxy, other core indicators)

ID	Subindicator	Type
<input type="text" value="09b"/>	<input type="text" value="Total greenhouse gas emissions (excluding LULUCF) from the national territory"/>	<input type="text" value="Core indicator"/>
<input type="text" value="10a"/>	<input type="text" value="CO2 emissions from fuel combustion attributable to the national economy"/>	<input type="text" value="Core indicator"/>
<input type="text" value="12"/>	<input type="text" value="Total greenhouse gas emissions from production activities"/>	<input type="text" value="Core indicator"/>
<input type="text" value="14"/>	<input type="text" value="Direct greenhouse gas emissions from households"/>	<input type="text" value="Core indicator"/>
<input type="text" value="07"/>	<input type="text" value="Greenhouse gas emissions intensity of agricultural commodities"/>	<input type="text" value="Contextual indicator"/>

Relevance

Policy context and rationale	<p>Excessive greenhouse gas emissions (GHG) by humans are the reason why our climate is changing. Reducing GHG emissions is the main course of action in our efforts to limit the change. High-quality monitoring of GHG emissions is hence essential.</p> <p>In addition, information is needed to better understand who emits, what they emit, and for which purposes. Extensive analyses of emissions are needed to find the most cost-effective methods to reduce them. Air emission accounts and their derived indicators can be used to model and investigate, for example, potential efficiency gains and macro-economic links. These analyses helps us to work towards the goals set in international agreements, including the Paris Agreement and the UNFCCC. At European level, emissions targets are set in Europe 2030: the EU policy, strategy</p>
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and legislation for 2030 environmental, energy and climate targets. Environmental accounts, such as air emission accounts, are used in economic-environmental modeling, for example for studies on eco-efficiency and resource and waste intensities, for environmental indicators, and for trade negotiations related to environmental impacts. Compatibility with the traditional national economic accounts greatly facilitates the integration of the environmental data into macroeconomic models and analysis. Indirect links to goals 7, 9, 12 and 13.

Related SDG indicator (SDG I.)

Not applicable

Relation w SDG-I.

Related Sendai Framework I.

Not applicable

Policy references

Document title	Link
Transforming our world: the 2030 Agenda for Sustainable Development (General Assembly of the United Nations, 2015)	https://sustainabledevelopment.un.org/post2015/transformingourworld
United Nations Framework Convention on Climate Change (United Nations Climate Change, 1994)	https://unfccc.int/process-and-meetings/the-convention/what-is-the-united-nations-framework-convention-on-climate-change
Paris Agreement (United Nations, 2015)	https://unfccc.int/process-and-meetings/the-paris-agreement/the-paris-agreement
European Union Climate Strategies and Targets (European Commission, 2008)	https://ec.europa.eu/clima/policies/strategies_en

Methodology

Methodology for indicator calculation

Total GHG emissions by economic activity are aggregated to a total for the national economy. The economic activities include production and consumption activities.

Total GHG emissions are calculated as the sum of individual greenhouse gas emissions: carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), perfluorocarbons (PFCs), hydrofluorocarbons (HFCs), sulphur hexafluoride (SF₆) and nitrogen trifluoride (NF₃), measured in units of CO₂-equivalent, by using a common weighting factor, the so-called Global Warming Potentials (GWP). The enhanced transparency framework for action and support of the Paris Agreement (see Article 13), further set out in the modalities, procedures and guidelines (see part D. Metrics), establishes that each Party shall use the 100-year time-horizon GWP values from the IPCC Fifth Assessment Report. GWP values are listed in Table 8.A.1 in Appendix 8.A of Chapter 8 – “Anthropogenic and natural radiative forcing”

The GWP values for the main direct GHGs are as follows: CO₂ = 1, CH₄ = 28, N₂O = 265, SF₆ = 23500, NF₃ = 16100. GWP values for HFCs and PFCs vary for individual species. These values are to be used for reporting on GHG emissions under the Paris Agreement.

Reporting by Annex I Parties under the UNFCCC is still on the basis of GWP values of the Fourth IPCC AR (see Table 2.14 of the IPCC Fourth Assessment Report). These GWP values are: CO₂ = 1, CH₄ = 25, N₂O = 298, SF₆ = 22800, NF₃ = 17200.

Note: most non-Annex I Parties still use the Revised 1996 IPCC Guidelines for reporting and therefore use a different set of GWPs (from the IPCC Second Assessment Report).

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The gases listed in the first paragraph are the so-called direct GHGs. There exist also precursor gases: carbon monoxide (CO), nitrogen oxides (NOX), non-methane volatile organic compounds (NMVOCs), as well as sulphur oxides (SOX). The emissions of precursor gases are not included in total emissions and are therefore not part of this indicator.

Methodology references

Document title	Link
Modalities, procedures and guidelines for the transparency framework for action and support referred to in Article 13 of the Paris Agreement (UNFCCC, 2018)	https://unfccc.int/documents/184700
IPCC Fifth Assessment Report: Climate Change 2014 (Synthesis Report) (Intergovernmental Panel on Climate Change (IPCC), 2014)	https://www.ipcc.ch/report/ar5/syr/
IPCC 5th Assessment Report: Chapter 8 - Anthropogenic and natural radiative forcing (IPCC, 2013)	https://www.ipcc.ch/site/assets/uploads/2018/02/WG1AR5_Chapter08_FINAL.pdf
IPCC Fourth Assessment Report: The Physical Science Basis (Intergovernmental Panel on Climate Change (IPCC), 2007)	https://www.ipcc.ch/report/ar4/wg1/
Manual for air emission accounts (Eurostat, 2015)	https://ec.europa.eu/eurostat/web/products-manuals-and-guidelines/-/KS-GQ-15-009
System of Environmental Economic Accounting 2012 Central Framework (United Nations, European Commission, Food and Agriculture Organization of the United Nations, OECD, World Bank, 2014)	https://seea.un.org/content/seea-central-framework

Classification syst. International Standard Industrial Classification of All Economic Activities (ISIC), Statistical classification of economic activities in the European Community (NACE), Classification of Individual Consumption by Purpose (COICOP)

Data sources

Main source Official statistics: SEEA and/or SNA

Explanation National SEEA air emission accounts

SEEA Accounts that can serve as data sources

SEEA Account	Comments
Air emission accounts	

UN-FDES 3.1.1: Emissions of greenhouse gases

International databases containing this indicator

Eurostat database	https://ec.europa.eu/eurostat/data/database
OECD Air Emissions Accounts	https://stats.oecd.org/Index.aspx?DataSetCode=AEA

Comments

Comments The reported value for indicator 9a should equal the sum of indicators 12 (total greenhouse gas emissions from production activities) and 14 (direct greenhouse gas emissions from households)